REMARKS/ARGUMENTS

Claim 1 has been amended to require that the dielectric layer has a crystallinity of greater than 90% and an RMS roughness of less than 1.5 nm.

New claim 32 has been added requiring the substrate to be glass.

New claims 33 and 34 have been added requiring specific crystallinity and roughness characteristics. Also, claims 2 and 7 have been amended to require specific crystallinity and roughness characteristics.

New claim 35 has been added requiring the ion beam to come from a linear ion source.

Support for these amendments and new claims exists throughout the present application, including page 4, lines 26-28, and page 6, lines 13-14.

Claims 16-28 have been canceled.

Claims 1-15 and 29-35 are pending, although claims 29-31 have been withdrawn from consideration. Upon indication of allowable subject matter, Applicants intend to seek rejoinder of the withdrawn claims as appropriate.

The Office Action rejected claims 1-15 under 35 U.S.C. § 112, second paragraph, as being indefinite, and objected to claim 3. Applicants respectfully submit that the above amendments to claims 1 and 3 have rendered this rejection and objection moot, and that they should be reconsidered and withdrawn.

The Office Action also rejected claims 1-14 under 35 U.S.C. § 103 as obvious over U.S. patent application publication no. 2002/0086164 ("Anzaki I") in view of Wasa ("Handbook of Sputter Deposition Technology") and further in view of U.S. patent application publication no. 2002/0139772 ("Fenner"), claim 15 under 35 U.S.C. § 103 as obvious over Anzaki I, Wasa, Fenner, and U.S. patent 6,316,110 ("Anzaki

II"). In view of the following comments, Applicants respectfully request reconsideration and withdrawal of these rejections.

The present invention relates to a coated dielectric layer having a crystallinity of greater than 90% and an RMS roughness of less than 1.5 nm. Thus, the present invention provides for dielectric layers having good crystallinity and minimal roughness at the same time. As explained in the present application, such layers having such properties considerably improve the quality of, for example, epitaxially grown metal layers on such layers. (See, paragraph bridging pages 9-10). It is through exposure to at least one ion beam coming from an ion source, preferably a linear ion source, that the unique dielectric layers having the unique required properties are obtained. Nothing in any of the applied art teaches or suggests the claimed substrates having the required unique dielectric layer, or methods for obtaining such coated substrates.

As recognized by the Office Action, Anzaki I "is silent regarding the layers being crystallized and the layer being sputtered in the presence of an ion beam from an ion source." (Office Action at page 5). Indeed, Anzaki I provides no details concerning the sputtering methods by which the 7-layered laminate disclosed therein can be formed on a substrate.

In an attempt to compensate for this fatal deficiency, the Office Action asserted, among other things, that one of ordinary skill in the art would have been motivated to produce "smooth" layers because "it is known in the art that if layers are deposited on top of each other, that the layers are better adhered to the surfaces of the layers below if the surfaces are smooth." The Office Action further asserted that Wasa teaches heating substrates and adjusting magnetron parameters to yield substrates having both smoothness and crystallization, leading one of ordinary skill in the art to seek additional ways to produce smooth products and thus to Fenner's use of an ion beam from an ion source. However, these assertions miss the point.

Fenner is the only applied reference relating to ion beams. However, Fenner relates to improvements of "GCIB" or gas cluster ion beam, which Fenner explains is a way to smooth surfaces after their fabrication by deposition. (Col. 1, par. [0002]). Fenner further explains that use of high energy beams in GCIB results in rough surfaces. (Col. 2, par. [0007]). Fenner's "invention" relates to applying numerous etching processes to a surface using progressively lower energy beams to reportedly yield a smoother surface.

In essence, the rejection is based on the assertion that one skilled in the art would undergo Fenner's multiple etching process for each layer in Anzaki I's 7-layer laminate. This certainly would not be the case.

By way of background, present invention relates to industrially-sized substrates, preferably glass substrates, covered with a stack of thin layers by magnetron technology. Typically, the layers are deposited on glass sheets of approximately 6m x 3m, and the magnetron is dimensioned to make it possible to deposit the layers over the entire width of the glass sheet. The targets used therefore have lengths of about 3m. The magnetron typically functions uninterrupted 24 hours a day.

Thus, the pending rejection requires that after each layer deposited in Anzaki I, the magnetron would be stopped, and Fenner's multi-step etching process would be performed. This cumbersome process, including stopping and starting the "continuously running" magnetron would occur 5 more times to produce a single product. Practically speaking, such a process would never be performed. More importantly, though, no motivation would ever exist to combine these processes. Rather, the motivation would be to avoid such a cumbersome combination, particularly in view of the fact that Anzaki I does not require any special sputtering techniques to produce its 7-layered laminate.

In stark contrast, the present invention relates to products produced by methods which allow a continuously running magnetron. Thus, the present invention makes it possible to

produce the claimed products having the required properties without having to change the magnetron target and/or to disrupt then reinstitute vacuum conditions. Such a process and products made by such process are nowhere taught or suggested by the applied art.

More specifically, none of the applied art teaches, suggests, recognizes any benefits associated with, or would lead one of ordinary skill in the art to produce the claimed products by the identified methods, with the expectation or belief that products having the required roughness and crystallinity characteristics could be efficiently produced.

In view of all of the above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103.

Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

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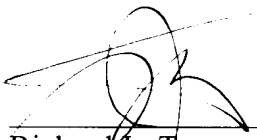

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